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Serial No. 09/287,573

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correl. 44. The method according to claim 40, further comprising, determining outlying beads and excluding outlying beads from said subpopulation.- -.

REMARKS

Claims 16-44 are pending. Claim 16 and 25 are amended to include performing a statistical analysis. Support is found at p. 49, line 20-21. New claims 27-44 find support at p. 49, line 20 to p. 52, line 14. A copy of the pending is appended hereto for the Examiner's convenience.

While no fee is believed due, the Commissioner is authorized to additional fees which may be required, or credit any overpayment, to Deposit Account No. 06-1300 (Our Order No. A-67207-2/DJB/RMS/DCF).

The applicants submit that the claims are now in condition for allowance and an early notification of such is respectfully solicited.

Respectfully submitted,

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Pending claims:

16. (Amended) A method for [reducing] increasing the signal-to-noise ratio in the characteristic optical response [signature] of a sensor array having subpopulations of sensor elements comprising:

a) measuring the optical responses [signature] of at least two of said sensor elements of at least one of said subpopulations upon exposure to a target analyte; [and]

~~/~~ b) summing the optical response [signatures]; and

c) performing a statistical analysis on said measurements of at least one of said subpopulations.

17. A method according to claim 16 wherein prior to said summing, the baseline of at least one optical response signature is adjusted.

18. A method according to claim 16 wherein the signal-to-noise ratio is increased by a factor of at least 10.

19. The method of claim 16 wherein an analyte detection limit is reduced by a factor of at least 100.

20. The method of claim 15 wherein said sensor array comprises a population of beads dispersed on a substrate.

21. The method of claim 20 wherein said substrate is a fiber optic bundle.

22. The method of claim 20 further comprising identifying the location of each sensor element within each sensor subpopulation within the array.

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23. The method according to claim 16 wherein said sensor elements comprise chemical functional groups.

24. The method according to claim 16 wherein said sensor elements comprise oligonucleotides.

25. (Amended) A method for amplifying the characteristic optical response [signature] of a sensor array having subpopulations of sensor elements comprising:

- a) measuring the optical response [signature] of at least two of said sensor elements of at least one of said subpopulations upon exposure to a target analyte; [and]
- b) summing the optical responses [signatures]; and
- c) performing a statistical analysis on said measurements of at least one of said subpopulations.

26. A method according to claim 25 wherein prior to said summing, the baseline of at least one optical response signature is adjusted.

Please add the following new claims:

- 27. A method comprising:

- a) providing an array with a plurality of subpopulations of sensor elements;
- b) measuring the optical response of each sensor element upon exposure to a target analyte; and
- c) performing a statistical analysis on said measurements of at least one of said subpopulations.

28. The method according to claim 16, 25 or 27, wherein each subpopulation comprises a

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bioactive agent.

29. The method according to claim 28, wherein at least one of said bioactive agents is a nucleic acid.
30. The method according to claim 28, wherein at least one of said bioactive agents is a protein.
31. The method according to claim 16, 25 or 27, further comprising determining outlying beads and excluding outlying beads from said subpopulation.
32. The method according to claim 16, 25 or 27, wherein said statistical analysis comprises calculating the mean of at least one subpopulation.
33. The method according to claim 16, 25 or 27, wherein said statistical analysis comprises calculating the standard deviation of at least one subpopulation.
34. The method according to claim 16, 25 or 27, further comprising evaluating the statistical validity of said measurements.
35. The method according to claim 16, 25 or 27, further comprising performing a second statistical analysis on said measurements.
36. The method according to claim 35 wherein said second statistical analysis comprises evaluating said measurements using confidence intervals.
37. The method according claim 35, wherein said second statistical analysis comprises using

said measurements to perform hypothesis testing.

38. The method according to claim 16, 25 or 27, further comprising comparing said statistical analysis of at least two subpopulations.

39. The method according to claim 38, wherein said statistical analysis comprises performing a cluster analysis of said subpopulation.

40. A method comprising:

a) providing an array comprising beads on a substrate comprising a plurality of subpopulations of sensor elements, wherein each sensor element comprises a bioactive agent that will bind a target analyte, and at least two of said subpopulations comprise different bioactive agents that will bind the same target analyte;

b) measuring the optical response of each sensor element; and

c) performing a statistical analysis on said measurements of at least one of said subpopulations.

41. The method according to claim 40, wherein at least two of said subpopulations each comprise bioactive agents that will bind different target analytes.

42. The method according to claim 41, wherein at least one of said bioactive agents is a nucleic acid.

43. The method according to claim 41, wherein at least one of said bioactive agents is a protein.

44. The method according to claim 40, further comprising, determining outlying beads and

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excluding outlying beads from said subpopulation.- -.